

Attending to this matter

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Date

2004-06-22

Your Date

Reference

P17069WO/04:1247

Your Reference

PCT/SE2003/001000

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Patent- och registreringsverket
Box 5055
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Dear Sirs,

International application No. PCT/SE2003/001000

Applicant: Telefonaktiebolaget LM Ericsson (publ)

Title: Management system and method for service subscription provisioning

Our Reference: P17069WO

Enclosures

Replacement sheets 34-48 (new claims 1-20)

Replacement sheets 34-49 (with marked amendments)

Replacement sheets 4, 5 and 5a (description)

Replacement sheets 4, 5 and 5a (with marked amendments)

In response to the written opinion issued on 29 April 2004 for the above application, hereinafter the present application, in which original claims 1 – 2, 8 and 10 were objected due to lack of inventive step over the disclosure in document D1 US-A-5579384 when combined with D2 WO 0038437 or with D3 US-A1-2002/013827, the following is submitted on behalf of the applicant:

Submissions

The new Claim 1 is a combination of features in the old claims 1 and 4, wherein features known from prior art D1, which is found the closest prior art, have been incorporated in the preamble, and wherein the characterizing portion includes features from the old claims 1 and 4 not anticipated by D1. The admissible amendment is supported on paragraphs [0059] and [0068] of the present application.

Claims 2 and 3 are not amended.

The new claim 4 is a combination of the old claims 5 and 6, where a redundant feature has been eliminated, with those features from the old claim 4 not included in the new claim 1; now with reinstated dependence. The admissible amendment is supported on paragraphs [0063] - [0065] of the present application.

The new claim 5 includes all the features from the old claims 7 and 9.

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The new claim 6 corresponds to the old claim 8, and is not amended but for reinstating dependences.

The new claim 7 is new and addresses a Management Entity suitable for the management system of claim 1. This new claim 7 includes all the features of claim 1 relevant for the Management Entity. Support for this claim can be found in the old claim 1 along with paragraphs [0054] and [0056], and with due regard to the exemplary embodiment shown on paragraphs [0060] and [0061] of the present application.

The new claim 8 is new and is based on all the features of claim 1 relevant for the Management Entity in combination with all the features from the old claims 7 and 9, now combined in the new claim 5. Support for this claim can be found on paragraphs [0068] - [0069] and [0079] of the present application.

The new claim 9 is new and addresses a Network Element suitable for the management system of claim 1. This new claim 9 includes all the features of claim 1 relevant for the Network element. Support for this claim can be found in the old claim 1 along with paragraphs [0054] and [0056], and with due regard to the exemplary embodiment shown on paragraphs [0063], [0064] and [0066] of the present application.

The new claim 10 is new and is based on all the features of claim 1 relevant for the Network Element in combination with all the features from the old claims 7 and 9, now combined in the new claim 5. Support for this claim can be found on paragraphs [0068] - [0069] and [0079] of the present application.

The old claim 10, as presently on file, is removed.

Claims 11-20 are not amended.

Novelty

Even though novelty was not called into question in this Written Opinion, the applicant is pleased to discuss the novel contribution of the present application in order to better place the reader into a favorable position for analyzing the inventive step.

D1 addresses the problem of modelling the information stored in Network elements for management and control of said Network Elements so that changes at one procedure level do not interfere other procedure levels in order to increase flexibility and efficiency of network performance.

Therefore, D1 provides for:

A management system comprising a Management Entity (SMS in the wording of D1) that has a Provisioning Node side (14 in D1) intended for provisioning a service, and a number of Managed Entities (NE1, NE2 in D1) each one having a Provisioned Node side (12 in D1) intended for receiving provisioning orders from the Management Entity (SMS), wherein:

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- the Provisioning Node side (14) and the number of Provisioned Node sides (12) support a Subscription Management Generic Interface (SuM-GI in the present application and SMS/NE interface 26 in the wording of D1) that includes a SuM-GI Data Model (NDO in D1);
- the Provisioning Node side (14) has a number of Protocol Adapters (SIPF in D1) for communicating with specific protocol technologies (26 in D1) used at each Managed Entity (NE1, NE2); and
- each Provisioned Node side (12) has at least one Protocol Adapter (SIPF in D1) for communicating with a particular protocol technology used by the Management Entity (SMS, 22 in the wording of D1) to send provisioning orders;

Apart from these features, D1 teaches the the Management Entity has the means for collecting "Images" (NEImage in the wording of D1) of a data model in each Managed Entity (NE1, NE2), which thanks to the protocol adapters (NE Interface 26 in D1) and thanks to transformation functions (50 in D1) in the client side - Management Entity (SMS, 22 in the wording of D1), contribute to build up the generic data model in the management system as illustrated in Fig. 4 and 5 of D1 and described in Col.7 lines 47-63.

That is, in accordance with D1, an Image of the data model in each particular Network Element is obtained in the management entity, and with help of transformation functions, likely isolated from the client applications, a generic user data model is built up.

This behaviour is absolutely different from the one applied in the present application whereby, as described on paragraph [0059], the Provisioning Node does not need know the details of each particular data model of the different Provisioned Nodes. This new behaviour, as compared to the teaching in D1, is obtained in accordance with the present application by having the management system of claim 1 wherein:

- the provisioning node side comprises a SuM-GI Manager (310) for sending provisioning orders (P-01, P-02) to manage subscriptions to services in any Managed Entity (100, 200) with a number of SuM-GI Operations operating on Objects Classes included in the SuM-GI Data Model;
- each provisioned node side (100, 200) comprises a SuM-GI Agent (110, 210) for receiving provisioning orders with a number of SuM-GI Operations operating on Objects Classes included in the SuM-GI Data Model; and
- the provisioned node side in at least one Managed Entity (100, 200) includes a Mapping Module (120, 220) for mapping the received instances of the SuM-GI Data Model (P-01, P-02) into an internal data model (130, 230).

None of these features is provided in D1 since the provisioning orders sent from the management system in D1 has already operated the generic data model, with help of previously collected data Images, before being submitted to the Network Element and, consequently, the receiver agent at the Network Element does not receive generic operations acting on generic data model but rather, specialized network data objects supported by the specific Network Element. Indeed, the Network Element of D1, which is

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the Provisioned Node side in the wording of the claim 1 in the present application, does not describe any Mapping Module in charge of mapping the generic data model into its own internal data model as stated on paragraph [0059] by determining and identifying the internal Managed Object Class on which the agent has to operate, as described on paragraph [0062] for example.

Thus, D1 does not anticipate a SuM-GI Manager sending the provisioning orders with a number of SuM-GI (generic) Operations operating on (generic) Objects Classes included in the SuM-GI Data Model; a SuM-GI Agent receiving provisioning orders with a number of SuM-GI (generic) Operations operating on (generic) Objects Classes included in the SuM-GI Data Model; and a Mapping Module at the Provisioned Node in charge of mapping the generic data model into its own internal data model.

Thereby, it is respectfully submitted that the new claim 1, as filed herewith, is novel in view of D1.

Inventive Step

Starting from D1 an important issue that the present application faces is how to provide a generic management system comprising a number of provisioning nodes and another number of provisioned nodes, whereby a provisioning node does not need to know the details of each particular data model of the different provisioned nodes.

D1 does not solve this problem since the provisioning node always gets images of the data model in each provisioned node

D2 discloses a similar teaching as the one presented in D1 with the only architectural difference of separating a couple formed with the NE INT.SERVER (28) and the NE-INTERFACE (26) in the wording of D1 from the management system (SMS), this couple being referred to as a Service Agent (30) in the wording of D2.

Thus, the solution provided for in D2 places a Service Agent (30) in an intermediate node that also comprises a database (32) for storing network overview knowledge (network modelling), the Service Agent being in charge of overall subscription handling duties and coordinating the access from customer administrative system (24) to the network elements (26).

This behaviour in D2 obliges to update the Service Agent (30) at any time a new network element of a different technology is introduced in the network. As for D1, this behaviour in D2 is absolutely different from the one applied in the present application whereby, as described on paragraph [0059], the Provisioning Node (400 in the wording of the present application and in view of Fig. 2) does not need to know the details of each particular data model of the different Provisioned Nodes (network elements).

That is, starting from D1 and applying the teaching in D2, a person of ordinary skill in the art would have readily separated the couple formed with the NE INT.SERVER (28) and the NE-INTERFACE (26) from the management system (SMS) in D1, thus obtaining the Service Agent (30) of D2, and would have included the database (32) also described in D2 for storage of network overview knowledge to accommodate the provisioning orders from the administrative system to the data models of the network elements.

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By applying this teaching in D2 in combination with D1, a person skilled in the art does not arrive to the features in the present application to solve the above issue aiming the present invention whereby a provisioning node does not need to know the details of each particular data model of the different provisioned nodes.

More specifically and as for D1, D2 does not anticipate a SuM-GI Manager sending the provisioning orders with a number of SuM-GI (generic) Operations operating on (generic) Objects Classes included in the SuM-GI Data Model; a SuM-GI Agent receiving provisioning orders with a number of SuM-GI (generic) Operations operating on (generic) Objects Classes included in the SuM-GI Data Model; and a Mapping Module at a Provisioned Node in charge of mapping the generic data model into its own internal data model.

Thereby, it is respectfully submitted that the new claim 1, as filed herewith, is inventive over the teaching in D1 alone or in combination with D2.

On the other hand, D3 addresses the problem of managing functionality shared among many different applications and users for providing a variety of services to the users and independently of the access network where the users are accessing through, and independently of the core and service networks involved to serve the user, and independently of the variety of protocols required by the entities, namely the applications, end-user terminals, access network entities, core network entities, service network entities, and other dedicated servers.

Therefore, D3 provides for a centralized entity, the Personal Service Environment Manager (PSEM), that is intended to facilitate a horizontally layered Service Network, thus separating applications and servers from the access and core networks. This PSEM entity is a central point of the Service Network and is in charge of storing personal information such as user profiles, defining the presentation of services to the users, handling end-user service provisioning and acting as the end users' contact point for managing their own personal service environment.

D3 shows, on the other hand, a quite distributed architecture where not only the functions but also related data are shared between different entities. For example, user profile data are stored in a Common User Profile Directory (CUPD) and are accessible to the PSEM entity where the User Profile Data manager is located via a dedicated interface such as LDAP and with help of protocol translators and API's (Application Programming Interface), as disclosed in paragraphs [0050], [0058] and [0067].

In this respect, PSEM includes functions for handling service data, end-user profile data, and end-user service profile data and, amongst others, important aspects of the PSEM are its interfaces to other entities and functions and its distinction between service data, end-user profile data, and end-user service profile data, as stated in paragraph [0065] of D3.

A first teaching in D3 is that the central entity PSEM makes use of a number of different protocols and suitable APIs for communication with different entities within the service network, namely applications and services, as described in paragraphs [0079] – [0086], wherein a plurality of API's are referred depending on the particular entity (WAP, WEB, HLR, CUPD) communicating with the PSEM or other entities.

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An immediate consequence from the above teaching is that there is no disclosure in D3 of a Subscription Management Generic Interface (SuM-GI) that includes a SuM-GI Data Model and a number of SuM-GI Operations operating on Objects Classes included in the SuM-GI Data Model.

Thus, D3 can by no means anticipate a SuM-GI Manager sending the provisioning orders with a number of SuM-GI (generic) Operations operating on (generic) Objects Classes included in the SuM-GI Data Model; a SuM-GI Agent receiving provisioning orders with a number of SuM-GI (generic) Operations operating on (generic) Objects Classes included in the SuM-GI Data Model; and a Mapping Module at a Provisioned Node in charge of mapping the generic data model into its own internal data model.

Thereby, neither the architectural organization of the whole system presented in D3, nor the PSEM entity alone, offers any incentive for a person skilled in the art, starting from D1 alone or in combination with D2, arrive to the features of the present application to solve the above issue aiming the present invention, whereby a provisioning node does not need to know the details of each particular data model of the different provisioned nodes.

Consequently, it is respectfully submitted that the new claim 1, as filed herewith, is inventive over the teaching in D1 alone or in combination with D2 and D2.

Moreover, given that the system in D1 comprises a Provisioning Node side and a Provisioned Node side, and provided that both entities contribute with its particular novel and inventive features to the novelty and inventiveness of the system, both entities as claimed in independent claims 7 and 9 filed herewith would be novel and inventive in view of D1, D2 and D3, alone or in combination.

In this respect, neither D1, nor D2, nor D3 disclose a Management entity having a Provisioning Node side that includes a SuM-GI Manager sending the provisioning orders with a number of SuM-GI (generic) Operations operating on (generic) Objects Classes included in the SuM-GI Data Model.

Moreover, neither D1, nor D2, nor D3 disclose a Network Element having a SuM-GI Agent receiving provisioning orders with a number of SuM-GI (generic) Operations operating on (generic) Objects Classes included in the SuM-GI Data Model; and a Mapping Module in charge of mapping the generic data model into its own internal data model.

Thereby, it is respectfully submitted that the new independent claims 7 and 9, as filed herewith, are novel and inventive over the teaching in D1, D2 and D3, alone or in combination.

Consequently, it is respectfully submitted that the new independent claims 1, 7, 9 and 11 filed herewith are novel and inventive over the teaching in D1, D2 and D3, alone or in combination; and the new claims 2-6, 8, 10, and 12-20, being ultimately dependent on claims 1, 7, 9 and 11 respectively, must be novel and inventive as well.

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Consequently, it is respectfully submitted that the new claims 1 to 20 as filed herewith satisfy the provisions of A.33(2) PCT, A.33(3) PCT, and A.6 PCT. Thereby, a favourable reconsideration is hereby requested. Should the examiner be of the opinion that further objections may arise, and in view that the term until the IPER must be established will not expire until the 18th of November 2004, issuance of a second Written Opinion is hereby also requested, allowing the applicant to file a response thereto.

Yours faithfully,

For Telefonaktiebolaget LM Ericsson (publ)

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user groups. Relevant aspects of said PSEM are its interfaces to other entities and functions, its distinguishing between user profile data and service-related data, the latter in terms of service profile data and service data, and its further distinguishing between service profile data and service data.

[0010] This Personal Service Environment Manager is only applicable in the Service Network, and it is attached to a particular protocol, namely a Lightweight Directory Access Protocol (LDAP), with help of protocol translators and suitable Application Programming Interfaces (API's). This solution, while enough to accomplish its purpose, becomes quite restrictive and hardly applicable when the intention is to provide a solution covering all network parts that likely include several network domains, applying to different nodes that manage multiple variety of protocols, and thus harmonising a common provisioning mechanism.

[0011] A still further teaching in respect of management of user-service relationships is found in the European patent publication EP 1 128 695. This teaching proposes a Telecommunication system for managing user-service relationships and the corresponding software. The system comprises a memory for storing user signals defining users and for storing service signals defining user-service relationships. More particularly, the system defines three kinds of signals representing, users, services and user-service relationships.

[0012] The teaching behind this application is, however, strongly oriented to user-service relationships whereas a complete interface solution applying to different provisioning and provisioned network entities is not sufficiently disclosed. Thus, the invention does not seem

to be directly applicable for networks including several network domains wherein service data may be more significantly linked to subscribers than to users in a particular domain. Moreover, this application rather seems
5 to apply for local establishment of appropriate relationships between user and service data than to manage a generic provisioning mechanism applying to different nodes with a variety of protocols, and thus harmonising with a common provisioning mechanism.

10 [0013] The solutions in the above applications as well as other currently existing mechanisms for provisioning of services still present quite significant drawbacks for approaching a generic mechanism that is not essentially coupled with a particular technology, a particular data
15 modelling, or a particular Operation and Maintenance system.

[0014] That is, quite a few existing solutions are based on a tight-coupling with a particular technology like, for example, Java or CORBA or LDAP. This technology coupling
20 assumes the need for supporting a given technology for the communications protocol and/or the data modelling language in both parts of the provisioning interface. Nevertheless, forcing a specific technology is not always an acceptable solution.

25 [0015] In addition to the technology coupling, there is also a quite extended trend to provide solutions where the coupling is addressed to an applicable data model. In this respect, existing interfaces have strong dependencies with the data models of the services being provisioned, making
30 such provision complex to extend and to improve. A typical example of this data model coupling is how embedded the data model is within the commands on proprietary Command Line Interfaces (CLI) for provisioning. An exemplary

solution of dependences with data models may be found in US
5,579,384 wherein a centralized management entity collects
Images of a data model in each managed entity and, with
help of protocol adapters and transformation functions,
5 contributes to build up a generic data model towards the
end-users and other systems. This solution, whilst arranged
for building up a generic interface, requires the
modification of the centralized management entity whenever
new managed entities, or new data models in each managed
10 entity, are introduced in the network.

CLAIMS

1. A management system for provisioning services to subscribers of a communication network, the management system comprising a Management Entity that has a Provisioning Node side (300) intended for provisioning a service, and a number of Managed Entities each one having a Provisioned Node side (100, 200) intended for receiving provisioning orders from the Management Entity, wherein:
 - 10 - the Provisioning Node side and the number of Provisioned Node sides support a Subscription Management Generic Interface (SuM-GI) that includes a SuM-GI Data Model;
 - the Provisioning Node side (300) has a number of Protocol Adapters (301, 302, 303) for communicating with specific protocol technologies (CORBA, SOAP, LDAP) used at each Managed Entity; and
 - 15 - each Provisioned Node side (100, 200) has at least one Protocol Adapter (CORBA, LDAP) for communicating with a particular protocol technology used by the Management Entity to send provisioning orders;
- 20 the management system **characterized in that:**
 - the provisioning node side comprises a SuM-GI Manager (310) for sending provisioning orders (P-01, P-02) to manage subscriptions to services in any Managed Entity (100, 200) with a number of SuM-GI Operations operating on Objects Classes included in the SuM-GI Data Model;

- each provisioned node side (100, 200) comprises a SuM-GI Agent (110, 210) for receiving provisioning orders with a number of SuM-GI Operations operating on Objects Classes included in the SuM-GI Data Model; and
 - the provisioned node side in at least one Managed Entity (100, 200) includes a Mapping Module (120, 220) for mapping the received instances of the SuM-GI Data Model (P-01, P-02) into an internal data model (130, 230).
2. The management system of claim 1, wherein the Subscription Management Generic Interface (SuM-GI) is arranged for holding specific attributes or characteristics of those objects included in the SuM-GI Data Model in a generic information placeholder associated to each particular object.
3. The management system of claim 2, wherein the Subscription Management Generic Interface (SuM-GI) is arranged for allowing each individual SuM-GI Agent to determine whether or not each particular attribute in a list of attributes is applicable in the node where the SuM-GI Agent resides, the applicability depending on a specific internal data model in said node.
4. The management system of claim 1, wherein at least one Managed Entity (100, 200) is a Network Element in which a given service is provisioned, and wherein a number of Managed Entities may optionally form a hierarchical Sub-Network Manager (400) structure interposed between a centralized Management Entity (300) acting as a Network Manager, and a number of Network Elements (100, 200), each Sub-Network Manager (400) comprising: a SuM-GI Manager (310), a SuM-GI Agent (410) and a number of

Protocol Adapters (301, 302, 303), thus presenting a Provisioned Node side towards a Provisioning Node side (300) at a Network Manager or at another Sub-Network Manager, and a Provisioning Node Side towards a Provisioned Node side (100, 200) at a Network Element or at another Sub-Network Manager.

5. The management system of claim 1, wherein the Subscription Management Generic Interface (SuM-GI) includes a SuM-GI Data Model characterized in that it comprises any Managed Object Class, or combinations thereof, selected from a group of Object Classes that includes:

- Subscription object class, intended for modeling the agreement or contract established between a subscriber and a service provider and arranged for containing all the information related with the subscription;

- Subscriber object class, intended for identifying a subscriber holding a subscription with a service provider for a given service and arranged for registering a number of users allowed to use said given service;

- ProvidedService object class, intended for modeling a service provider inventory of offered services and arranged for maintaining applicable capabilities of said offered services;

- User object class, intended for identifying a user associated to a given subscriber and arranged for customizing particular user preferences for a given service;

- 5 - UserServicePreferences object class, intended for allowing a number of users associated with a subscriber to have particular service preferences and arranged for containing different service capabilities enabled for each user;
 - 10 - SubscriptionIRP object class, intended for indicating to a SuM-GI Manager the SuM-GI version supported by each particular SuM-GI Agent in a Managed Entity, and thus arranged for comprising a list of the SuM-GI versions supported by known SuM-GI Agents;
 - 15 - SubscriptionFunction object class, intended for sub-classing Subscription, Subscriber, User, and UserServicePreferences related object classes and arranged for providing attributes that are common to underlying Managed Object Classes; and
 - 20 - ServiceProviderFunction object class, intended for sub-classing ProvidedService related object classes and arranged for providing attributes that are common to underlying Managed Object Classes.
6. The management system of claim 5, wherein the Subscription Management Generic Interface (SuM-GI) includes a SuM-GI Operation set intended to act on the SuM-GI Data Model and characterized by comprising any
- 25 Operations, or combinations thereof, selected from groups of operations that include:
- creating, modifying, removing and getting Subscriber;
 - creating, modifying, removing and getting User;

- creating, modifying, removing and getting Provided Service.
- creating, modifying, removing and getting Subscription;
- 5 - adding, removing and getting User to or from a given Subscription; and
- setting and getting User Service Preferences for a user under a given Subscription;
- 7. A Management Entity having a Provisioning Node side
10 (300, 400) intended for provisioning a service towards a Network Element (100, 200) by sending provisioning orders (P-01, P-02), the Management Entity supporting a Subscription Management Generic Interface (SuM-GI) that includes a SuM-GI Data Model and suitable for use in
15 the management system of claim 1, the Management Entity comprising:
 - at least one Protocol Adapter (301, 302, 303) for communicating with a specific protocol technology (CORBA, SOAP, LDAP) used at the Network element; and
 - 20 - a SuM-GI Manager (310, 310) for sending provisioning orders (P-01, P-02) to manage subscriptions to services in the Network Element (100, 200) with a number of SuM-GI Operations operating on Objects
25 Classes included in the SuM-GI Data Model, and independently from an internal data model (130, 230) used by the Network Element.
- 8. The Management Entity of claim 7, wherein the Subscription Management Generic Interface (SuM-GI) includes a SuM-GI Data Model characterized in that it
30 comprises any Managed Object Class, or combinations

thereof, selected from a group of Object Classes that includes:

- 5 - Subscription object class, intended for modeling the agreement or contract established between a subscriber and a service provider and arranged for containing all the information related with the subscription;
- 10 - Subscriber object class, intended for identifying a subscriber holding a subscription with a service provider for a given service and arranged for registering a number of users allowed to use said given service;
- 15 - ProvidedService object class, intended for modeling a service provider inventory of offered services and arranged for maintaining applicable capabilities of said offered services;
- 20 - User object class, intended for identifying a user associated to a given subscriber and arranged for customizing particular user preferences for a given service;
- 25 - UserServicePreferences object class, intended for allowing a number of users associated with a subscriber to have particular service preferences and arranged for containing different service capabilities enabled for each user;
- SubscriptionIRP object class, intended for indicating to a SuM-GI Manager the SuM-GI version supported by each particular SuM-GI Agent in a Managed Entity, and thus arranged for comprising a

list of the SuM-GI versions supported by known SuM-GI Agents;

- 5 - SubscriptionFunction object class, intended for sub-classing Subscription, Subscriber, User, and UserServicePreferences related object classes and arranged for providing attributes that are common to underlying Managed Object Classes; and
 - 10 - ServiceProviderFunction object class, intended for sub-classing ProvidedService related object classes and arranged for providing attributes that are common to underlying Managed Object Classes.
9. A Network Element (100, 200) where a service is provisioned to subscribers of a communication network, the Network Element suitable for being used as a
- 15 Managed Entity in the management system of claim 1 and supporting a Subscription Management Generic Interface (SuM-GI) that includes a SuM-GI Data Model, the Network Element comprising:
- 20 - at least one Protocol Adapter (CORBA, LDAP) for communicating with a particular protocol technology used by a Management Entity to send provisioning orders;
 - 25 - a SuM-GI Agent (110, 210) for receiving provisioning orders with a number of SuM-GI Operations operating on Objects Classes included in the SuM-GI Data Model; and
 - a Mapping Module (120, 220) for mapping received instances of the SuM-GI Data Model (P-01, P-02) into an internal data model (130, 230).

10. The Network Element of claim 9 wherein the Subscription Management Generic Interface (SuM-GI) includes a SuM-GI Data Model characterized in that it comprises any Managed Object Class, or combinations thereof, selected from a group of Object Classes that includes:
- 5 - Subscription object class, intended for modeling the agreement or contract established between a subscriber and a service provider and arranged for containing all the information related with the subscription;
 - 10 - Subscriber object class, intended for identifying a subscriber holding a subscription with a service provider for a given service and arranged for registering a number of users allowed to use said given service;
 - 15 - ProvidedService object class, intended for modeling a service provider inventory of offered services and arranged for maintaining applicable capabilities of said offered services;
 - 20 - User object class, intended for identifying a user associated to a given subscriber and arranged for customizing particular user preferences for a given service; and
 - 25 - UserServicePreferences object class, intended for allowing a number of users associated with a subscriber to have particular service preferences and arranged for containing different service capabilities enabled for each user
 - 30 - SubscriptionIRP object class, intended for indicating to a SuM-GI Manager the SuM-GI version

supported by each particular SuM-GI Agent in a Managed Entity, and thus arranged for comprising a list of the SuM-GI versions supported by known SuM-GI Agents;

- 5 - SubscriptionFunction object class, intended for sub-classing Subscription, Subscriber, User, and UserServicePreferences related object classes and arranged for providing attributes that are common to underlying Managed Object Classes; and
- 10 - ServiceProviderFunction object class, intended for sub-classing ProvidedService related object classes and arranged for providing attributes that are common to underlying Managed Object Classes.
- 11. A method for provisioning services to subscribers of a
15 communication network, the method applying between a Management Entity that has a Provisioning Node side intended for provisioning a service, and a number of Managed Entities each one having a Provisioned Node side intended for receiving provisioning orders from
20 the Management Entity, the method **characterized by** comprising the steps of:
 - assigning a specific protocol technology for
25 communication between a Subscription Management Generic Interface (SuM-GI) Manager at a Provisioning Node side and each SuM-GI Agent at respective Provisioned Node sides;
 - sending provisioning orders from a SuM-GI Manager
30 toward at least one SuM-GI Agent with a number of SuM-GI Operations intended for operating on Object Classes included in a SuM-GI Data Model; and

- determining at a SuM-GI Agent, upon receipt of a provisioning order from a SuM-GI Manager, whether current node is a Network Element (NE) where the service is provisioned or there is at least one lower hierarchical Managed Entity, namely a Sub-
5 Network Manager or a Network Element, where the provisioning order must be submitted.
12. The method of claim 11, wherein upon receipt of a provisioning order from a Subscription Management
10 Generic Interface (SuM-GI) Manager in a SuM-GI Agent at a Sub-Network Manager, the method further comprises the steps of:
- transferring the provisioning order received from a first SuM-GI Manager at a Provisioning Node side of
15 a Management Entity or higher hierarchical Managed Entity toward a second SuM-GI Manager at a Provisioning Node side of the current node;
 - assigning a specific protocol technology for communication between the second SuM-GI Manager at
20 the Provisioning Node side of the current node and each SuM-GI Agent at respective Provisioned Node sides of lower hierarchical Managed Entities; and
 - sending provisioning orders from the second SuM-GI
25 Manager toward at least one SuM-GI Agent at a Provisioned Node side of a lower hierarchical Managed Entity with a number of SuM-GI Operations intended for operating on Object Classes included in a SuM-GI Data Model.
13. The method of claim 11, wherein upon receipt of a provisioning order from a Subscription Management
30 Generic Interface (SuM-GI) Manager in a SuM-GI Agent at

a Network Element, the method further comprising the steps of:

- 5 - mapping the provisioning order received from a SuM-GI Manager at a Provisioning Node side with a number of SuM-GI Operations intended for operating on Object Classes included in a SuM-GI Data Model into a number of internal operations intended for operating on an internal data model supported by the current Network Element; and
 - 10 - acting on the internal data model with the mapped internal operation in order to carry out the provisioning order received from a SuM-GI Manager at a Provisioning Node side.
14. The method of claim 13, wherein upon receipt of a provisioning order from a Subscription Management Generic Interface (SuM-GI) Manager in a SuM-GI Agent at a Network Element for which resulting data is expected, the method further comprising the steps of:
- 15 - mapping the resulting data of an internal data model into appropriate parameters of a number of SuM-GI Operations intended for operating on Object Classes included in a SuM-GI Data Model; and
 - 20 - returning provisioning order results from the SuM-GI agent toward the SuM-GI Manager at a Provisioning Node side of a Management Entity or higher hierarchical Managed Entity with appropriate parameters in a number of SuM-GI Operations intended for operating on Object Classes included in a SuM-GI Data Model.
 - 25

15. The method of claim 11, wherein the Subscription Management Generic Interface (SuM-GI) includes a SuM-GI Data Model characterized in that it comprises any Managed Object Class, or combinations thereof, selected from a group of Object Classes that includes:
- Subscription object class, intended for modeling the agreement or contract established between a subscriber and a service provider and arranged for containing all the information related with the subscription;
 - Subscriber object class, intended for identifying a subscriber holding a subscription with a service provider for a given service and arranged for registering a number of users allowed to use said given service;
 - ProvidedService object class, intended for modeling a service provider inventory of offered services and arranged for maintaining applicable capabilities of said offered services;
 - User object class, intended for identifying a user associated to a given subscriber and arranged for customizing particular user preferences for a given service; and
 - UserServicePreferences object class, intended for allowing a number of users associated with a subscriber to have particular service preferences and arranged for containing different service capabilities enabled for each user.
16. The method of claim 11, wherein the Subscription Management Generic Interface (SuM-GI) includes a SuM-GI

Operation set intended to act on a SuM-GI Data Model and characterized by comprising any Operations, or combinations thereof, selected from groups of operations that include:

- 5 - creating, modifying, removing and getting Subscriber;
- creating, modifying, removing and getting User;
- creating, modifying, removing and getting Provided Service.
- 10 - creating, modifying, removing and getting Subscription;
- adding, removing and getting User to or from a given Subscription; and
- setting and getting User Service Preferences for a
- 15 user under a given Subscription;

17. The method of claim 15, wherein the Subscription Management Generic Interface (SuM-GI) further comprises any Managed Object Class, or combinations thereof, selected from a group of Object Classes that includes:

- 20 - SubscriptionIRP object class, intended for indicating to a SuM-GI Manager the SuM-GI version supported by each particular SuM-GI Agent in a Managed Entity, and thus arranged for comprising a list of the SuM-GI versions supported by known SuM-
- 25 GI Agents;
- SubscriptionFunction object class, intended for subclassing Subscription, Subscriber, User, and UserServicePreferences related object classes and

arranged for providing attributes that are common to underlying Managed Object Classes; and

- ServiceProviderFunction object class, intended for sub-classing ProvidedService related object classes and arranged for providing attributes that are common to underlying Managed Object Classes.

18. The method of claim 11, wherein the Subscription Management Generic Interface (SuM-GI) is arranged for holding specific attributes or characteristics of those objects included in the SuM-GI Object Model in a generic information placeholder associated to each particular object.

19. The method of claim 18, wherein the Subscription Management Generic Interface (SuM-GI) is arranged for allowing each individual SuM-GI Agent to determine whether or not each particular attribute in a list of attributes is applicable in the node where the SuM-GI Agent resides, the applicability depending on a specific internal data model in said node.

20. A use of a Subscription Management Generic Interface (SuM-GI) comprising a SuM-GI Data Model and SuM-GI Operations intended for provisioning services to subscribers of a communication network wherein said Subscription Management Generic Interface (SuM-GI) operates in accordance with an Integration Reference Point (IRP) specification within an IRP Generic Network Resource Model by further comprising any Managed Object Class, or combinations thereof, selected from a group of Object Classes that includes:

- SubscriptionIRP object class, intended for indicating to a SuM-GI Manager the SuM-GI version

supported by each particular SuM-GI Agent in a Managed Entity, and thus arranged for comprising a list of the SuM-GI versions supported by known SuM-GI Agents;

- 5 - SubscriptionFunction object class, intended for sub-classing Subscription, Subscriber, User, and UserServicePreferences related object classes and arranged for providing attributes that are common to underlying Managed Object Classes; and
- 10 - ServiceProviderFunction object class, intended for sub-classing ProvidedService related object classes and arranged for providing attributes that are common to underlying Managed Object Classes.